

But why do I have to prove it? Why can't the burden of proof be placed on those who are not mindful of the landscape? Why should not the highway builders and their sponsors be made to demonstrate that their efforts contribute more to human welfare than do the lands they take away? Why should they continue to build successively larger patterns of concrete with no apparent responsibility to plough up the lesser roads we had before? At peak hours on the Bayshore Highway near my home, autos use about 5 percent of the capacity of the road. And we build more of these. We need public transportation desperately. This is the crucial issue.

Let me give another example. The great manufacturers of cans are delighted to discover how popular their containers have become. How cheap it is to get the metals back! I wasn't trained for this. Even the instructions for salvage seem somehow abrasive to me. Whose time is used to crush or clean out and segregate containers of different types? Can money ever really compensate for this strange new use for time? Perhaps merit badges for container recognition and bottle washing can replace those for woodcraft. We must tax these throwaway items out of existence.

There is a single thread in this terse statement. Let's fight the big fights. We can be flattered into a career of cosmetic surgery or we can opt for redirection.

On "Chemicals in the Environment"

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THE MASSIVE environmental dosage of chemicals we are now receiving, continues blithely along in the face of the most incredibly incriminating ecologic evidence of long range toxicity affecting

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every order of living species. Dr. Rudd** has beautifully presented the problem of the progressive chemical pollution of our world at the hands of industrial man and the call for action is clear.

Annually, we deposit the equivalent of 220 pounds of synthetic organic pesticides on every square mile of the U.S.A. DDT and related chlorinated hydrocarbons (nondegradable) sprayed or dusted on the land, wash in the streams, lakes and ultimately the ocean. Insoluble in water and highly soluble in fats and oils, DDT and relatives are rapidly absorbed into algae and plankton and here the disaster begins. At levels of a few parts per million (ppm) plankton photosynthesis is halted and the world's oxygen supply could be threatened if ocean levels reach these critical amounts. Tiny fish and shellfish consume the plankton, and concentrate the DDT and like compounds in their fats. Larger fish feed upon the smaller ones and so on up the line, progressive concentration of the chemicals occurring. Birds, mammals and man eat the fish and are receiving ever greater dosages of these compounds. The devastating effects on reproduction of lesser animals is measurable. Shellfish transmitting DDT residues greater than 0.5 parts per million to their eggs, kill the larvae, which could explain the decline of shellfish in our coastal waterways. At 2.9 ppm salmon are unable to acclimatize and at 20 ppm, fingerling trout and salmon die. (Striped bass from our Sacramento River Delta have DDT levels as high as 119 ppm and the famed Lake Michigan Coho salmon are banned for interstate sale because of concentration of 20 ppm.) In birds, DDT apparently stimulates the liver to make an enzyme-destroying estradiol which regulates calcium metabolism and thus they lay insufficiently calcified eggs and now whole species of fish-eating birds, including the much publicized brown pelicans on Anacapa Island, are faced with total reproductive failure and extinction. The toxic effect of smaller concentrations on man is as yet undetermined. Higher concentrations are associated with encephalomalacia, hepatitis and cirrhosis, and in experimental animals carcinomatosis occurs in subsequent generations.

In the face of these terrible occurrences on our entire ecosystem, it is urgent that we, as physicians, actively support legislation which requires elimination of these nondegradable compounds

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and support legislation to help screen, develop and produce viable substitutes.

As Dr. Rudd so ably pointed out, the toxic effects of lead and mercury have been known a long time but it has only been since the advent of leaded gasolines that worldwide contamination with lead has occurred. Fortunately, lead is now being phased out by most of the major gasoline companies, as these terrible long-term effects are being clearly defined. Mercury, mostly appearing in the environment as methyl mercury, widely used as a fungicide on seed and in the pulp industry, concentrated in the muscle of fish and in eggs of poultry that feed on mercury-contaminated grain, has caused toxic disasters in man consuming these foods. As a result of the widespread use of mercury compounds, biologic magnification of the effect is similarly occurring. Unless the use of mercury is stopped now, truly dangerous toxic effects will soon become evident and widespread.

It is imperative that the world not be the site of massive uncontrolled experimentation with any new chemical, no matter how exciting the initial effects appear to be. Each should be evaluated for biodegradability and the long-term effects upon the entire ecosystem.

Semantic Pollutants

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THE PRINCIPAL CONTRIBUTION of modern psychiatry to the predominantly biophysically-oriented theories and practice of medicine is its emphasis on the interpersonal aspects of health and disease. It is concerned with the person who is ill and the social conditions of his existence. These psychosocial vectors appear as myth and tradition, belief-systems with their moral sanctions, political organization and activities, marketing techniques, and the like, and are mediated by non-verbal and verbal systems of communication. Analysis of human eco-systems, therefore, should include the role of "collective representations" that, to a pro-

found degree, govern the transactions between individuals and groups. Transmitted via the arts and literature of earlier as well as present generations, collective representations (including the structure of language itself) constitute the man-produced matrix called culture by which man's evaluations of himself and his environment are molded. That such mechanisms of human conditioning have produced psychophysiological degrees of anxiety sufficient to cause neurotic and psychotic incapacitation, violence directed against self and others, and a frenetic searching for panaceas and magical solutions is not only a matter of record but also constitutes a major public health problem today. Therefore, to our knowledge of biophysical vectors of disease must be added awareness of the role of psychosocial mechanisms of information collecting and retrieval. Communicable diseases are, at least in part, due to diseases of communication.

A verbal statement, a chemical equation or a mathematical formula is efficient only if it transmits with fidelity the relations between whatever is going on at macroscopic, microscopic or sub-microscopic levels. Like maps, such formulations must be similar in structure to the territory they were designed to represent. This is the reason why new languages of different structure are devised, such as higher mathematics, to avoid the structural limitations of older forms of representation. Our ordinary popular language, with its subject-predicate form, its elementalistic terms (for example, "mind," "body"), its tendency to equate parts with wholes, etc., transmits much false-to-fact information because of its primitive logical structure derived from preliterate macroscopic observation. There is little difference epistemologically between the simple cause and effect assumptions underlying exorcizing demons or destroying insect vectors; both procedures initiate sequential pathology neither implied nor predicted by the "logic" of the cause and effect statement in conventional language.

The structural assumptions conveyed by the unified field theories of modern science would avoid simplistic notions of cause and effect with their potentially dangerous consequences. We must, then, become aware of the structural or epistemological assumptions implicit in ordinary languages since, via the press and color television today, they produce and in great measure control the beliefs and assumptions, frequently uncon-